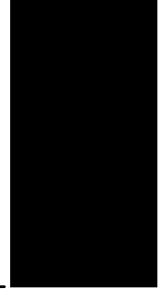
Index



Α

Agency Approvals, 2-7
ASCII Table, G-2
Auxiliary Functions, 3-16, A-2
Handheld Programmer Configuration, A-10
Memory Cartridge Operations, A-11
Password Operations, A-12
RLL Operations, A-5

В

Bases, 2-10 CPU DIP Switches, 2-12 Types, 2-11 Battery Backup, 3-12 BCD Numbers, 3-33 Bit Maps, 3-44 to 3-57 Boolean Instructions, 5-4, 5-10 to 5-25

C

Cables, Programming, 2-15
Clock and Calendar, A-8
Instructions, 5-175
Communication Ports, Specifications, 3-9 to 3-12
Connect Solid State Devices, 2-21

Connector, I/O Ribbon Cable, 2-31
CPU
Auxiliary Functions, A-2
Battery Replacement, 9-2
Clock and Calendar, 3-15
Features, 3-2, 3-6
Memory Map, 3-34
Operating Modes, A-4
Operating System, 3-18
Password Protection, 3-15
Scan Time, 3-26
Setup, A-8
Set the Network Address, A-9
Specifications, 3-4 to 3-6
Status Indicators, 9-9

D

Diagnostics, 3-23
DIP Switches, 3-8

DirectNET, Port Configuration, 4-21
Disabling Outputs, A-9
DL405 Aliases, 3-43

Drum Instruction Programming, 6-2
Control Techniques, 6-10
Drum Operation, 6-8
Step Transitions, 6-4 to 6-7

CPU Control Instructions, 5-177

Index-2

Drum Instructions, 6-12 to 6-14 Stage, 7-23 Stage Counter, 5-49 to 5-50 Drum instructions, EDRUM, 6-14 Stage Programming, 7-2 Subroutines, 5-181 Timers, 5-41 to 5-45 Е Up/Down Counter, 5-51 to 5-52 Intelligent I/O Instructions, 5-189 Error Codes, B-2 to B-8 Interrupt Instructions, 5-185 European Directives, I-2 Instructions, Compare, 5-82 to 5-86 Event drum, 6-15 K F Force I/O, 3-20 Keyswitch Functions, 3-7 Hexadecimal Numbers, 3-33 Local I/O Expansion, 4-11 М Maintenance, 9-2 I/O Modules, I/O Configuration, A-6 Battery Maintenance, 9-2 I/O Response Time, 3-24 Code Identifiers, 9-6 I/O Wiring and Specifications, 2-27 Diagnostics, 9-4 I/O Module Charts, 2-33 Error Code Locations, 9-5 System Error Codes, 9-8 Instruction Execution Times, C-2 to C-22 Test Modes, 9-19 Instructions Manual Organization, 1-2, 1-6 Accumulator/Data Stack, 5-54 to 5-57 ASCII to HEX, 5-135 Masked Drums, 6-18 BCD to Binary, 5-128 Math Instructions, 5-87 Binary to BCD, 5-129 Increment, 5-117 Binary to Real, 5-132 Increment Binary, 5-120 Bit Operations, 5-121 to 5-127 Transcendental Functions, 5-118 Comparative Boolean, 5-26 to 5-31 Memory, F-2 Counters, 5-46 to 5-48 Set Retentive Ranges, A-9 Encode, 5-126 End Statement, 5-4 Memory Cartridge, 3-14 Execution Times, C-2 to C-28 Memory cartridge, battery replacement, 9-3 Gray Code, 5-139 HEX to ASCII, 5-136 Memory Map Immediate Instructions, 5-32 to 5-40 DL430, 3-40 Interrupts, 5-186 DL440, 3-41 Load Label, 5-162 DL450, 3-42 Master Control Relays, 5-183 Message Instructions, 5-194 to 5-204 Move, 5-146 Move Memory Cartridge, 5-162 MODBUS, Port Configuration, 4-20 Out, 5-65 to 5-68 Module Placement, 4-4 Real to Binary, 5-133 I/O Configuration, 4-5 Set Bit, 5-167

Shift Register, 5-53

Mounting Guidelines, 2-6 Base Dimensions, 2-5 Panel Layout, 2-6 N Network Address, A-9	Auto Tuning Error, 8-47 Hysteresis, 8-13, 8-36, 8-38 Monitor Limit, 8-35 Overflow/Underflow Error, 8-38 Programming Error, 8-38 PV Deviation, 8-36 Rate-of-Change, 8-13, 8-37 Setup Alarms, 8-35
	PID Loop
Network connections, MODBUS & <i>Direct</i> NET, 4–18	Alarms, 8-13
Network Instructions, 5–191	Configure, 8-26
Network Master Operation, 4-28 to 4-31	Features, 8-2, 8-3
Network Slave Operation, 4-22	Feedforward Control, 8-70 Freeze Bias, 8-11, 8-34
Number Conversion Instructions, 5-128	Loop Definitions, 8–21
Numbering Systems BCD, H-5 Binary, H-2 Floating Point, H-6 Hexadecimal, H-3 Octal, H-4	Mode, 8-28 Operating Modes, 8-14 Special Loop Calculations, 8-14 Setup, 8-18 Terminology, 8-74 Time-Proportioning Control, On/Off Control Example, 8-67
Octal Numbers, 3-32	Transfer Mode, 8-27 Troubleshooting Tips, 8-72, 8-74 Tuning, 8-40 Auto , 8-44 Manual, 8-41 to 8-44
	PID Mode 2 Word Description, 8-23
Р	PID Mode Setting 1 Description, 8-22
Part Numbering, 1-8	PID Position Algorithm, 8–9, 8–15 Position Form, 8–9
Passwords, A-12	·
PID Analog Filter, 8-53 Bumpless Transfer, 8-13, 8-27	PID Velocity Algorithm, 8-9 Algorithm Form, 8-12 Velocity Algorithm, 8-15
Cascade Control, 8-63	Pointers, 5-58
Tuning, 8-67 Control Introduction, 8-4	Power Budget, 4-7 Calculation Example, 4-9
<i>Direct</i> SOFT 5 Filter, 8-54 DL450 Control, 8-6	Power Budget , Worksheet, 4-10
Error Flags, 8-18	Product Weights, E-2
Error Term Selection, 8-33	Program Control Instructions, 5-179
Loop Modes, 8-28, 8-52	Program Media, 3-13
On/Off Control, 8-68 Operation, 8-9	•
Parameters, 8-32	Program Mode, 3-19
PID View, 8-49 to 8-51 Ramp/Soak, 8-39 Reset Windup, 8-10, 8-34 Special Features, 8-52 Time Proportioning, 8-68 PID Alarms	Programming Accumulator Logic Instructions, 5-70 to 5-85 Bit Operation Instructions, 5-121 to 5-127 Comparative Boolean, 5-7 Compare Instructions, 5-82 to 5-86 Counters, 5-46 to 5-48 Instruction Set Table, 5-2 to 5-4
Alarm Features, 8-3	Load Instructions, 5–59 to 5–64

Index-4

Midline Outputs, 5–5 Out Instructions, 5–65 to 5–68 Pointers, 5–58 POP Instruction, 5–69 Shift Register, 5–53 Timers, 5–41 to 5–45

Programming Methods, 1-4

Q

Quick Start, 1-10, 1-12

R

Ramp/Soak Generator, 8-56
Controls, 8-58
DrectSOFT Example, 8-60
Flag Bit Description Table, 8-24
Profile Monitoring, 8-59
Table, 8-56
Table Flags, 8-58
Table Location, 8-25
Test the Profile, 8-62, 8-64
Testing, 8-59

Remote I/O Expansion, 4-12 Retentive Memory, A-9 Run Mode, 3-19

S

Safety Guidelines, 2-2 Emergency Stops, 2-3

Safety guidelines, Orderly System Shutdown, 2-4

Scan Time

Display, A-8

Set the Watchdog Timer, A-8

Scan Time Configuration, 3-15

Sinking/Sourcing, 2-19

Special Relays, D-2 to D-4

Specialty I/O, 3-20

Stage Programming, 7-2

Garage Door Opener Example, 7-10

Initial Stages, 7-5

Introduction, 7-2

Jump Instruction, 7-7

Parallel Processing Concepts, 7-19

Power Flow Transition, 7-18

Program Organization, 7-15 Stage View, 7-28 State Transition Diagrams, 7-3 Unconditional Outputs, 7-18

Status Indicators, 3-7

System Components, 1-4

System CRs, 3-39

System Design, 1-16

System Design Strategies, 4-2

System Parameters, 3-38

Т

Table Instructions, 5-142
Technical Support, 1-2, 1-6
Test Modes, A-9
Timed Drum, 6-16
Transient Suppression, 2-23
Troubleshooting
Electrical Noise, 9-16
I/O modules, 9-14

V

V-memory Operations, A-6

W

Wiring

Expansion Unit, 2-14 I/O Module, 2-30 I/O Strategies, 2-16 I/O wiring strategies, 2-17 Multi-point Modules, 2-31 Power Input, 3-8

Wiring Guidelines, 2-13